AQUEOUS ORAL CARE COMPOSITIONS

BACKGROUND

Dry mouth may be caused by several different factors including but not limited genetics, systemic illness, reactions to medications and aging. The degree to which an individual can experiences dry mouth can vary greatly. Stimulation of saliva production and use of oral moisturizers and substitute saliva are used to reduce dry mouth. Saliva production may be stimulated by various modalities such as mechanical, chemical, electrical and pharmacological. Of the products commercially available, the degree and duration of effectiveness varies. Thus, there is a need for more effective, longer lasting compositions that can be used to moisten the oral cavity and reduce dry mouth in individuals.

SUMMARY

Some embodiments of the present invention provide compositions that comprise a blend of polymers in proportions which form a viscoelastic polymer network with specific desirable rheological characteristics. In some embodiments, the composition delivers the polymer network to an oral cavity surface, which in turn serves as a mucoadhesive polymer film within the oral cavity, providing a coating that restores moisture and lubricity similar to that provided by natural saliva. In some embodiments, the polymer film binds water and provides relieves the feeling of dry mouth.

Some embodiments provide aqueous oral care compositions comprising: a gum-type colloidal polymer; a cellulosic polymer; an acrylate polymer; and an orally acceptable aqueous carrier. In some embodiments, the gum-type colloidal polymer is xanthan gum. In some embodiments, the cellulosic polymer is cellulose gum. In some embodiments, the acrylate polymer is carbomer. Some embodiments provide an aqueous oral care composition comprising: xanthan gum; cellulose gum; carbomer; and an orally acceptable aqueous carrier. Still other embodiments provide methods of treating or preventing a disease or condition of the oral cavity comprising contacting an oral cavity surface of a subject in need thereof, with any one of the compositions described herein.

DETAILED DESCRIPTION

As used throughout, ranges are used as shorthand for describing each and every value that is within the range. Any value within the range can be selected as the terminus of the range.

All references cited herein are hereby incorporated by reference in their entireties.

In the event of a conflict in a definition in the present disclosure and that of a cited reference, the present disclosure controls.

As used herein, the term "viscoelastic fluid" refers to a complex fluid that exhibits mechanical properties that are both elastic (solid-like e.g. rubber) and viscous (liquid-like, flowable e.g. water). A viscoelastic fluid composition will deform and flow under the influence of an applied shear stress (e.g. shaking or swishing in the mouth), but when the stress is removed the composition will recover from the deformation. The elastic portion of the viscoelastic behavior is quantified by the elastic modulus (G'), while the viscous portion is quantified by the viscous modulus (G").

As used herein, the term "shear thinning" refers to a property in which viscosity decreases with increasing rate of shear stress. Materials that exhibit shear thinning properties are called pseudoplastic.

As used herein, "structured fluid" and "structured composition" may be used interchangeably, and refer to a fluid that exhibits a G' value greater than the G" value (i.e. the ratio of G' to G" is >1) within the linear viscoelastic region of a strain sweep measurement. The ratio of G' to G" has been identified as the Structural Parameter.

Some embodiments provide aqueous oral care compositions comprising: a gum-type colloidal polymer; a cellulosic polymer; an acrylate polymer; and an orally acceptable aqueous carrier. In some embodiments, the gum-type colloidal polymer is xanthan gum. In some embodiments, the cellulosic polymer is cellulose gum. In some embodiments, the acrylate polymer is carbomer.

Some embodiments of the present invention provide aqueous oral care compositions comprising: xanthan gum; cellulose gum; carbomer; and an orally acceptable aqueous carrier. In some embodiments the compositions comprise: from about 0.01 to about 0.5%, by weight, xanthan gum; from about 0.01 to about 0.5%, by weight, cellulose gum; and from about 0.01 to about 0.5%, by weight, carbomer.

As used herein, the term "aqueous" refers to a free water content of at least about 40%, by weight.

In some embodiments, the compositions comprise from about 40 to about 97%, by weight, free water. In some embodiments, the compositions comprise greater than about 50%, by weight, free water. In some embodiments, the compositions comprise from about 50 to about 90%, by weight, free water. In some embodiments, the compositions comprise from about 60 to about 80%, by weight, free water. In some embodiments, the compositions comprise about 70%, by weight, free water. Some embodiments comprise about 70%, about 71%, about 72%, about 73%, about 74% or about 75%, by weight, free water.

Some embodiments provide compositions comprising: from about 0.05 to about 0.1%, by weight, xanthan gum. Further embodiments provide compositions comprising from about 0.05 to about 0.1%, by weight, cellulose gum. Other embodiments provide compositions comprising from about 0.03 to about 0.1%, by weight, carbomer.

Some embodiments provide compositions comprising: from about 0.05 to about 0.1%, by weight, xanthan gum; from about 0.05 to about 0.1%, by weight, cellulose gum; and from about 0.03 to about 0.1%, by weight, carbomer.

Some embodiments provide compositions comprising: from about 0.07 to about 0.09%, by weight, xanthan gum. Further embodiments provide compositions comprising from about 0.07 to about 0.09%, by weight, cellulose gum. Other embodiments provide compositions comprising from about 0.04 to about 0.06%, by weight, carbomer.

In some embodiments, the compositions comprise: from about 0.07 to about 0.09%, by weight, xanthan gum; from about 0.07 to about 0.09%, by weight, cellulose gum; and from about 0.04 to about 0.06%, by weight, carbomer.

Some embodiments provide compositions comprising: about 0.08%, by weight, xanthan gum. Further embodiments provide compositions comprising about 0.08%, by weight, cellulose gum. Other embodiments provide compositions comprising from about 0.05%, by weight, carbomer.

Still further embodiments provide compositions comprising: about 0.08%, by weight, xanthan gum; about 0.08%, by weight, cellulose gum; and about 0.05%, by weight, carbomer. Yet other embodiments provide compositions com-